

PROMOTER FOR THE EPIDERMIS-SPECIFIC TRANSGENIC  
EXPRESSION IN PLANTS

Schweizer et al.

Appl. No.: Unknown Atty Docket: MAIWAM7.005APC

Figure 1

GstA1 promoter

GACGCCGAAGTGGAGCCGACAGCCCCAGGTCCCAAGCCCTCGGCAGACTAGATCACTAGCCCTGGATCGGCCGAGGTGAC  
TGGATGACGAGCAGCACCTGGTCTGGCGGGTGTGGGCGAGTAGAACCAGGGGCGATGGCGACGCGCTGACCTTCTCCCC  
TCACCGGCGATCTGCTCCTTCTGGGTGGGGGTGCGCCGGCTGACGTTCTGTTGCGGGGTGGGGGTGCGCCGGCTGGCGTTCT  
GCTGCGGGGTGGGAGTCGCCGACCGGCGTGCTGCTAGGACAATCGGTGAGGCCAGTTAGGTGCTAGCCGATCGATTG  
GCCAAGAGATCCGAGTCCCTGGGGAGATCAGTGAGGCCAGGTGCTATTTGGCCTATCAATTGGCCAGGTTCTGGGAACGGG  
GCGTGGCGTGATCAACGAGGTGCTAGGCTGCTAGCTAGGGAAGTGGATCCTGGAACGTGGAGGAGGCAAGTCCGGTATGC  
TAAGTACTTTAACTTTCTTCTTACATCCACCTGATTCAGATTATTTTGATCTAAATTAAGTTGCAAAAAATATATGTG  
TGATATCCATCTACTATAATTGCTTACAATCAAATATATGTGATTTTTTTTAGTTTAGAAGATTATATGCACAGTAA  
ATCTGAATGTTCTTACATGCATGATTTAGTTAACTTTAAAGAGTTATACTAACTAGTCTTGATAAAGAGATCTTTTGG  
AGCAACACCAAACCTCGTGAGGTGTTTTGCCCTACGGAAGGTTGTGCTATGTAATGATTATTATTAGGATCAAAGTTGTA  
GGATAACGTAACCTTCTCGATGTATCTTTATACAACATTGTAGTTTAGTTATATATGGAGAGAGTGATTTAACACT  
TTGTGTTTAAAGAGTAGAATAAGTTATTCCACACTCTAGCCAAACGAAGTATTGGCAAATATCTCGCTAGCTGGTGAGAG  
CCAGAGCCGTGGAAAGTCTGTCTTGCTATTAAGGCACAAGCATCAAACAGGAACATTTAGAGCCATGGAAAGTGATGTG  
TCGCCTACCAATGGGCCAACTGCTAGCGATGTAATAATAGCATCAAAGTTGATTTTTTATAGAACATGCAAGGCGTTGGC  
AAGTGGGAAAATGATTGATCGCTGGCAAGCTTAACTCTCGGAAGTTATAGCATTCAACTGAATCAGAACAAAGATTAAAA  
AAAAATACATTTCCATCGATAGTGAAAAATTATTCAATTGAGTGACAACGAAATCATATTGGAATGTACATTTACTTGT  
TGATTTTAAATTAGAGGCATTTTCTACCTTTTTTAGTTAATAAGATATGCATATACCCACCCTTAGTGTTTTTCGAGACA  
ACGAGAGGGCACATTGCTTTTGGTGCTACCATCTCTCAAGCCTCAAATAAGTTGTGCGGACACGATTATCTTCCCGCG  
TTGGAATATCGTGGCCTGGTAGAGCTAGCGAAAAATCTTCCATGTTGGAATATGTGCGGCAGCCGGATAGCCGCCATGCAT  
GTAAAGTCTCTTTTACCTTTACACTTGCTCAAGTGACACTGTATGTCGCCTACCATTGCTAAATCAATGGGCCAACTGC  
TAGCGACGTAATAGTAGCAAGTTGATTTACAGTGTTTTGCTACAGTTCTCTGACTTTGTTTCTTCATTTTAGACTAGCTG  
ACTACTGTCGCTTACCTGCCTTCCCTTCTCCACGTTAGAGGATCCAGTTCTGATATTGAGACCTCGACGATGGGAGGAAG  
GGCGCGATCGATGTGGAGTAATTTGAATTTCAAATCTATCTATCTGGGGTATATTGGTCCCTTACCAGATGTTTGGGGGGC  
TGTGCGAAATTGGTTCGCGATCTACAAAAGTGAATGGAGGGAGTAGTTGTTTCTCCAATCCGTACCAACGCACGTGTTT  
CTAACTAGTACTTACTTCTTCCGACCACAATATGGAATAGAGGGAGTATCGATAAATAACAAAGATGATTACTTACCC  
GGTTTAAATGATTCAAGAGCTCATTTAATTTGGCACTCATTTTCATATATCTTTTTTGGTAGAAATGAAATAAAGCAG  
ATCTAGACACTAGCTAAAAAGTCGATGTAGCCTTGTTATTTTCTTGGGCCACGCGGGCCGGGTGTGGTGCTCCCTGCTCT  
GTGTATAATGGAGATCAACATCCAAGGCCTCCTCCCA

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Figure 2

WIR1A intron

GTCAGTCGTCGGACGGTGTCCGTTCAATTCCTCCCCATTTTGTAAATTGATTAACTTGTTATACATGCTGACCTCGACCTGCT  
GAATAACGTCCGTCCATGGTTTCCCGTCCAGGCACC

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Figure 3

GstA1 promoter with WIR1a exon/intron:

GACGCCGAAGTGGAGCCGACAGCCCCAGGTCCCAAGCCCTCGGCAGACTAGATCACTAGCCCTGGATCGGCGAGGTGAC  
TGGATGACGAGCAGCACCTGGTCTGGCGGGTGTGGGCGAGTAGAACCAGGGCGATGGCGACGCGCTGACCTTCTCCCC  
TCACCGCGCATCTGCTCCTTCTGGGTGGGGGTGCGCGGCTGACGTTCTGTTGCGGGGTGGGGTTCGCCGGCTGGCGTTCT  
GCTGCGGGGTGGGAGTCGCCGACCGCGTGCTGCTGCTAGGACAATCGGTGAGGCCAGTTAGGTGCTAGCCGATCGATTG  
GCCAAGAGATCCGAGTCTGGGAGATCAGTGAGGCCAGGTGCTATTTGGCCTATCAATTGGCCAGGTTCTGGGAACGGG  
GCGTGGCGTGATCAACGAGGTGCTAGGCTGCTAGCTAGGGAAGTGGATCCTGGAACGTGGAGGAGGCAAGTCCGGTATGC  
TAAGTACTTTAACTTTCCTTCTTACATCCACCTGATTGAGATTATTTTGGATCTAAATTAAGTAACTTGCAGGAAATATATGTG  
TGATATCCATCTACTATAATTGCTTACAATCAAAATTATATGTGATTTTTTTTAGTTTAGAAGATTATATGCACAGTAA  
ATCTGAATGTTCTTACATGCATGATTTAGTTAACTTTAAAGAGTTATACTAACTAGTCTTGATAAAGAGATCTTTTGG  
AGCAACACCAAACCTCGTGAGGTGTTTTGCCCTACGGAAGGTTGTGCTATGTAATGATTATTATTAGGATCAAAGTTGTA  
GGATAACGTAACCTTCTCGATGTATCTTTATACAACATTGAGTTTAGTTATATATGGAGAGAGTGATTTAACT  
TTGTGTTTAAAGAGTAGAATAAGTTATTCCACACTCTAGCCAAACGAACATTTTGGCAAATATCTCGCTAGCTGGTGAGAG  
CCAGAGCCGTGGAAAGTCTGTCTTGTCTATTAAGGCACAAGCATCAAACAGGAACATTTAGAGCCATGGAAAAGTGATGTG  
TCGCCCTACCAATGGGCCAACTCTGCTAGCGATGTAATAATAGCATCCAAGTTGATTTTTTATAGAACATGCAAGGCGTTGGC  
AAGTGGGAAAATGATTGATCGCTGGCAAGCTTAACTCTCGGAACCTATAGCATTCAACTGAATCAGAACAAAGATTAAAA  
AAAAATACATTTCCATCGATAGTGAAAAATTATTCAATTGAGTGACAACGAAAATCATATTGGAATGTACATTTACTTGT  
TGATTTTAAATTAGAGGCATTTTTCTACCTTTTTTAGTTAATAAGATATGCATATATCCACCTTAGTGTTTTCGAGACA  
ACGAGAGGGCACATTGCTTTTGGTGCTACCATCTCTCAAGCCCTCAAATAAGTTGTGCGGACACGATTATCTTCCCGCG  
TTGGAATATCGTGGCCTGGTAGAGCTAGCGAAAAATCTCCATGTTGGAATATGTCGGCAGCCGGATAGCCGCCATGCAT  
GTAAAGTCTCTTTTACCTTTACACTTGCTCAAGTGACACTGTATGTCGCTACCCTTGCTAAATCAATGGGCAACTGC  
TAGCGACGTAATAGTAGCAAGTTGATTTACAGTGTTTTGCTACAGTTCTCTGACTTTGTTTCTTCAATTTTAGACTAGCTG  
ACTACTGTCGCTTACCTGCCTTCCCTTCTCCACGTTAGAGGATCCAGTTCTGATATTGAGACCTCGACGATGGGAGGAAG  
GGCGCGATCGATGTGGAGTAATTTGAATTTCAAATCTATCTGCGGTATATTGGTCCCTTACCGATGTTTGGGGGGC  
TGTGCGAAATTTGGTTCCGCGATCTACAAAAGTGAATGGAGGGAGTAGTTGTTTCTCCAATCCGTACCAACGCACGTGTTT  
CTAACTAGTACTTACTTCTTCCGACCAACAATATGGAATAGAGGGAGTATCGATAAACTAACAAAGATGATTACTTACCC  
GGTTTAAATGATTCAAGAGCTCATTTAATTTGGCACTCATCATTTCATATATCTTTTTTGGTAGAAATGAAATAAAGCAG  
ATCTAGACACTAGCTAAAAAGTCGATGTAGCCTTGTTATTTCTTGGGCCACGCGGGCCGGGTGTGGTGCTCCCTGCTCT  
GTGTATAAATGGAGATCAACATCCAAGGCCTCCTCCACACACACACGCTACAGAGCAGAGCAGAGTCTTGCTCCAGTAT  
CTGCCCTCTCCTGCCTGCCTGTAGAGCATCCATCACGTGAAGTTCACGGACAACTACGTACACAGGCAGCTAGCTCTCG  
AAACCTCGCTCGAAACGCACCTGCAGATCGCTCTCTTCGTCGTCGTCGCGCGATCATCATCAACAGCTCCGTCTGCCTT  
GGAGCCACGGCCGTCCACGACGCCGCCGCTCAGGTGAGTCGTCGACGGTGTCCGTTCAATTTCTCCCATTTTTGTAA  
TTGATTAAGTTGTTATACATGCTGACCTCGACCTGCTGAATAACGTCCGTCCATGTTTCCCGTCCAGGCACC

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Figure 4

TaPERO cDNA:

ACCACCACACCACTCCACCAGTAAGAAGTGCAGCAGGTAGCTAGTAAGCCGGCGTAGCTTTGCTCTTGCAGCTAGCTAGC  
TAACCATGGCCGCCTCTGCCTCTTGCCCTTCTCTTGTGGTGCTCGTGGCTCTGGCCACGGCGGCGTCGGCGCAGCTGTCA  
CCGACCTTCTACGACACGTCCTGCCCCAGGGCCCTGGCCATCATCAAGAGTGGCGTCATGGCCGCGTGAGCAGCGACCC  
TCGGATGGGCGCGTCGCTCGCTCCGGCTGCACTTCCACGACTGCTTCGTCCAAGGCTGCGACGCGTCTGTTTTGCTGTCTG  
GCATGGAACAAAATGCTATCCCGAACGCGGGGTCGCTGAGGGGCTTCGGCGTCATCGACAGCATCAAGACGCAGATCGAG  
GCCATCTGCAATCAGACCGTCTCCTGCGCCGACATCCTCACCGTCGCGCCCGTGA CTCCGTTGTAGCCCTCGGAGGGCC  
GTCATGGACAGTCCCTCTGGGGAGAAGAGATTCCACAGATGCAAACGAGGCGGCGGCAAACAGCGACCTGCCAGGCTTTA  
CATCTAGCCGGTCAGATCTTGAGCTGGCATT CAGAAACAAGGGCCTCCTTACGATCGACATGGTGGCCCTCTCGGGCGCG  
CACACCATCGGCCAGGCGCAGTGTGGGACCTTTAAGGACAGGATCTACAATGAGACTAACATCGACACGGCCTTCGCCAC  
ATCTCTCCGGGCCAACTGCCCCAGGTCAAACGGCGACGGGAGCCTGGCGAACCTGGACACGACGACGGCCAACACGTTG  
ATAACGCCTACTACACCAACCTCATGTACAGAAGGGGCTCCTGCACTCGGACCAGGTGCTGTTCAACAACGACACCACC  
GACAACACTGTCCGGAACCTTGCGTCGAACCCAGCGGCGTTCAGCAGCGCCTTCACGACCGCCATGATCAAGATGGGCAA  
CATCGCGCCGAAGACAGGCACGCAGGGGCAGATCAGGCTCAGCTGCTCCAGGGTGA ACTCGTGATTGATAGACGAGTTAC  
TGCATACTAGCCAGCACGACACGTACGTGAATGAATAAGGCCACAGAACCAGTGGCCAATATAAATACCAGCTCTTGAAA  
CCGTGTATTTTATGTACGAGTAGCAGCAATCATGCATGCATCTACACATATATATGTAACGATCGAATCCC ACTTTCT  
CATGCAAAGGCATGGAGAATTACTATCAATCTTAGTTATACGTGTA

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Figure 5a:

characteristics of pPS41:

Total length:	7011 bp
vector Backbone: pBluescript SK+,	entire construct between XhoI and SacI restriction sites
GstA1 promoter	694-2891
Transcription start:	2892
GstA1 5' UTR	2892-2988
WIR1 5' UTR (part)	2989-3034
WIR1 part of 5' CDS + Intron	3035-3246
TAPERO cDNA	3264-4509
ATG TAPERO	3348
Stop codon:	4284
Poly(A)	4510-4514
CamV 35S Terminator:	4576-4776

CTAAATTGTAAGCGTTAATATTTTGTAAATTCGCGTTAAATTTTGTAAATCAGCTCATTTTTTAACCAATAGGCCG  
AAATCGGCAAAATCCCTTATAAATCAAAGAATAGACCGAGATAGGGTTGAGTGTGTTCAGTTTGGAAACAAGAGTCCA  
CTATTAAAGAACGTGGACTCCAACGTCAAAGGGCGAAAACCGTCTATCAGGGCGATGGCCCACTACGTGAACCATCACC  
CTAATCAAGTTTTTTGGGGTTCGAGGTGCCGTAAAGCACTAAATCGGAACCCCTAAAGGGAGCCCCGATTAGAGCTTGAC  
GGGGAAAGCCGGCGAACGTGGCGAGAAAGGAAGGAAAGCGAAAGGAGCGGGCGCTAGGGCGCTGGCAAGTGTAGCG  
GTCACGCTGCGCGTAACCAACACACCCGCGCTTAATGCGCGCTACAGGGCGCTCCCATTCGCCATTTCAGGCTGCG  
CAACTGTTGGGAAGGCGATCGGTGCGGGCTCTTCGTATTACGCCAGCTGGCGAAAGGGGATGTGCTGCAAGGGCAT  
TAAGTTGGGTAACGCCAGGGTTTTCCAGTCACGACGTGTAAACGACGGCCAGTGAGCGCGCTAATACGACTCACTA  
TAGGGCGAATTGGGTACCGGGCCCCCTCGAGTCTAGAATACTGAGTATCGGCGAGGTGACTGGATGACGAGCAGCACCTGGTCTGGC  
AGGTCCCAAGCCCTCGGCAGACTAGATCACTAGCCCTGAGTATCGGCGAGGTGACTGGATGACGAGCAGCACCTGGTCTGGC  
GGGTGTTGGGCGAGTAGAACAGGGGCGATGGCGACGCGCTGACCTTCTCCCTCACCGCGATCTGCTCCTTCTGGGTG  
GGGTGCGCGGCTGACGTTCTGTTGCGGGGTGGGGTTCGCGGCTGGCGTCTGCTGCGGGTGGGAGTCGCGGACCGGC  
GTGCTGCTGCTAGGACAATCGGTGAGGCCAGTTAGGTGCTAGCCGATCGATTGGCGAAGAGATCCGAGTCTGGGAGAT  
CAGTGAGGCCAGGTGCTATTTGGCCTATCAATTGGCCAGGTTCTGGGAACGGGCGTGGCGTGATCAACGAGGTGCTAGG  
CTGCTAGCTAGGGAACGTGATCCTGGAACGTGGAGGAGCAAGTCCGGTATGCTAAGTACTTTAACTTTCTTCTCACA  
TCCACCTGATTGAGATTATTTTGTATTAATTAAGTAACTTGAAGAAATATATGTGTATATCCATCTACTATAATTGCTTAC  
AATCAAAATATATGTGATTTTTTTTAGTTTGAAGATTTATATGCACAGTAAATCTGAATGTTCTTCATGCTGATGATT  
TAGTTTAACTTTAAAGAGTTATACTAAGTCTTTGATTAAGAGATCTTTGGAGCAACACCAAACTCTGAGGTGTTT  
TGCCTACGGAAGGTTGTGCTATGTAATGATTATTATTAGGATCAAAAGTTGATAGGATAAAGTAAACCTTCTCGATGTA  
TCTTTTATACAACATTGAGTTAGTTATATATGAGAGAGTGATTTAACACTTTGTGTTTAAAGAGTAGAATAGTTATT  
CCACACTCTAGCCAAACGAACTATTTGGCAATATCTCGTACGTGGTGAGAGCCAGAGCCGTGGAAAGTCTGCTTGTCT  
ATTAAGGCACAAGCATCAACAGGAACATTTAGAGCCATGGAAAAGTGATGTGTCGCCTACCAATGGGCCAACTGCTAGC  
GATGTAATAATAGCATCCAGTTGATTTTTTATAGAACATGCAAGGCGTTGGCAAGTGGGAAATGATTGATCCCTGGCA  
AGCTTAACTCTCGGAACCTATAGCATTCACTGAATCAGAACAAAGATTAAAAAATACATTTCCATCGATAGTGAAA  
AATTATTCAATTGAGTGACAACGAAATCATATTGGAATGTACATTTACTTGTGATTTTAAATTAGAGGCATTTTTCTA  
CCTTTTTTAGTTTAAAGATATGCATATACCCACCCTTAGTGTTCGAGACAACGAGAGGGCACATTGCTTTTGGTGCT  
ACCATCTCTCTCAAGCCTCAAATAAGTTGTGCGGACACGATTATCTTCCCGCGTTGGAATATCGTGGCCTGGTAGAGCTA  
GCGAAAATCTTCCATGTTGGAATATGTGCGGACGCGGATAGCCGCAATGCTGTAAGTCTCTTTTACCTTTTACACTTG  
CTCAAGTGACACTGTATGTCGCTACCACTTGCTAAATCAATGGGCCAACTGCTAGCGACGTAATAGTAGCAAGTTGATT  
TACAGTGTGTTGCTACAGTTCTGACTTTGTTTCTTCAATTTAGACTAGCTGACTACTGTGCTTACCTGCCTTCCCTT  
CTCCAGTTAGAGGATCCAGTTCTGATATTGAGACCTCGACGATGGGAGGAAGGGCGGATCGATGTGGAGTAATTTGAA  
TTTCAAATCTATCTATCTGGGTATATTGGTCTTCAACGATGTTTGGGGGCTGTGCGAAATTGGTTCCGCGATCTACA  
AAAGTGAATGGAGGGAGTAGTTGTTTCTCCAATCCGTACCAACGCACGTGTTTCTAACTAGTACTTACTTCTTCCGACC  
ACAATATGGAATAGAGGGAGTATCGATAAACTAACAAAGATGATTACTTACCCGGTTTAAATGATTCAAGAGCTCATTTA  
ATTTGGCACTCATCTTTTATATATCTTTTTTGGTAGAAATGAAATAAGCAGATCTAGACACTAGCTAAAAAGTCGATG  
TAGCCTTGTTATTTTCTTGGGCCACGCGGGCGGGTGTGGTGTCTCCCTGCTCTGTGTATAAATGGAGATCAACATCCAAG  
GCCTCTCCACACACACACGCTACAGAGCAGAGCAGAGTCTTGCTCCAGTATCTGCCCTCTCTGCTGCTGCTAGAGC  
ATCCATCAGTGAGTTTACGGACAACTACGTACACAGGCAGCTAGCTCTCGAAACCTCGTCGAAACGCACCTGCAGA  
TCGCTCTCTTCTGCTGCTGCGCGGATCATCAACAGCTCCGCTGCTGCTTGGAGCCACGGCGTCCACGACGCGCC  
GCCTCAGGTGAGTGTGCGGACGTTTCCGTTCCATTTCTTCCCTCCCATTTTGTAAATTGATTAACTGTTATACATGCTGACC  
TCGACCTGCTGATAACGTCGCTCCATGTTTCCGTTCCAGGCACCCGCGGTGAGGAATTACCAACACACCACTCCA  
CCAGTAAGAAGTGCAGCAGGTAGCTAGTAAGCCGCGCTAGCTTTGCTCTTGACGCTAGCTAGCTAACCATGGCGCTCT  
GCCTCTTGCTTTCTTGTGGTGTCTGCTGGCTTGGCCACGGCGCGTATGGCGCGAGCTGTACCGACCTTCTACGACAC  
GTCTGCCCCAGGGCCCTGGCCATCATCAAGAGTGGCTGCTTCCGCTGCGACGCTGTTTTGCTGCTGCTGGAACAAATGCT  
TGCTCCGGCTGCACTTCCACGACTGCTTCCGTTCCAGGCTGCGACGCGTCTGTTTTGCTGCTGCTGGAACAAATGCT  
ATCCGAACGCGGGTCTGCTGAGGGGCTTCCGCTCATCGACAGCATCAAGACGCAGATCGAGGCCATCTGCAATCAGAC  
CGTCTCTGCGCGACATCTTCCGCTGCGCGCGCTGACTCCGTTGAGCCCTCGAGGGCGGTCATGGACAGTCCCTC  
TGGGAGAAGAGATTCCACAGATGCAACGAGGGCGGCAACAGCGACCTGCCAGGCTTTACATCTACCGGTCAGAT  
CTTGAGCTGGCATTCAAGAAACAGGGCTCTTACGATCGACATGTTGGCTTCTCGGGCGGCACACCATCGGCCAGGC  
GCAGTGTGGGACCTTTAAGGACAGGATCTACAATGAGTAACTCGACACGGCTTCCGACATCTCTCCGGGCCAACT

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GCCCCAGGTCAAACGGCGACGGGAGCCTGGCGAACCTGGACACGACGACGGCCAACACGTTTCGATAACGCCTACTACAC  
AACCTCATGTACAGAAGGGGCTCCTGCACTCGGACCAGGTGCTGTTCAACAACGACACCACCGACAACACTGTCCGGAA  
CTTTGCGTCGAACCCAGCGGGCTTACGACGCGCTTACGACCGCCATGATCAAGATGGGCAACATCGCGCCGAAGACAG  
GCACGCAGGGGCGAGATCAGGCTCAGCTGCTCCAGGGTGAACCTCGTGATTGATAGACGAGTTACTGCATACTAGCCAGCAC  
GACACGTACGTGAATGAATAAGGCCACAGAACCAGTGGCCAATATAAATACCAGCTCTTGAACCGTGTATTTTATGTAC  
GAGTAGCAGCAAATCATGCATCTACACATATATATGTAACGATCGAATTCCCACCTTCTCATGCAAAGGCATGGAG  
AATTACTATCAATCTTAGTTATACGTGTATAAAAAGCGGCGCGAATTTCGATATCAAGCTTATCGATACCGTCGACCTCG  
ACCTGCAGGCATGCCGCTGAAATCACCAGTCTCTCTCTACAAATCTATCTCTCTATAAATATGTGTGAGTAGTTCCC  
AGATAAGGGAATTAGGGTTCTTATAGGGTTTCGCTCATGTGTTGAGCATATAAGAAACCCTTAGTATGTATTTGTATTTG  
TAAATACTTCTATCAATAAAATTTCTAATTCCTAAACCAAATCCAGGGGTACCGAGCTCGAATTCTAGTCTACGCGG  
CCGCGAGCTCCAGCTTTTGTTCCTTTAGTGAGGGTTAATTGCGCGCTTGGCGTAATCATGGTCATAGCTGTTTCTCTGTG  
TGAAATTTGTTATCCGCTCACAATCCACACAACATACGAGCCGGAAGCATAAAGTGTAAGCCTGGGGTGCCTAATGAGT  
GAGCTAACTCACATTAATTGCGTTGCGCTCACTGCCCGCTTCCAGTCGGGAAACCTGTCTGCTCACTGACTCGCTGCGCTCGGTC  
TCGGCCAAACGCGCGGGGAGAGGCGGTTTGGCTATTGGGCGCTCTTCCGCTTCTCGCTCACTGACTCGCTGCGCTCGGTC  
GTTCCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCGGTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAA  
GAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAGGCGCGGTTGCTGGCGTTTTTCCATAGGCTCCGCC  
CCCCTGACGAGCATCACAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTT  
CCCCCTGGAAGCTCCCTCGTGGCTCTCTGTTCCGACCTGCGGCTTACCGGATACCTGTCCGCTTCTCTCCCTTCGGG  
AAGCGTGGCGCTTTCTCATAGCTCAGCTGTAGGTATCTCAGTTCCGGTGTAGGTGCTTCCGCTCCTCGCTCCTAGCTGGGCTGTGTGC  
ACGAACCCCCCGTTACGCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTA  
TCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTG  
GCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTG  
GTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTGTTGCAAGCAGCAGATTACGCGCAGAAAA  
AAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAAACGAAACTCACGTTAAGGGATTTT  
GGTCATGAGATTATCAAAAAGGATCTTACCTAGATCCTTTTAAATTAATAATGAAGTTTTAAATCAATCTAAAGTATAT  
ATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTCAGCGATCTGTCTATTTTCGTTTCATCC  
ATAGTTGCCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAATGATACC  
GCGAGACCCACGCTCACCAGGCTCCAGATTTATCAGCAATAAACAGCCAGCCGGAAGGGCCGAGCGCAGAAAGTGGTCTG  
CACTTTTATCCGCTCCATCCAGTCTATTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTTCGCCAGTTAATAGTTTGGCG  
AACGTTGTTGCCATTGCTACAGGCATCGTGGTGTACGCTCGTCTGTTGGTATGGCTTCACTCAGCTCCGGTCCCAACG  
ATCAAGGCGAGTTACATGATCCCCATGTTGTGCAAAAAGCGGTTAGCTCCTTCGGTCTCCGATCGTTGTGAGAAGTA  
AGTTGGCCGCGAGTGTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTGATGCCATCCGTAAGATGCTTT  
TCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGGCCGCGTCAAT  
ACGGGATAATACCGCGCCACATAGCAGAACTTTAAAGTGCTCATCATTGGAAAACGTTCTTCGGGGCGAAACTCTCAA  
GGATCTTACCGCTGTGAGATCCAGTTTCGATGTAACCCACTCGTGACCCCACTGATCTTCAGCATCTTTTACTTTTACC  
AGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAGGGAATAAGGGCGACACGGAATGTTGAATACT  
CATACTCTTCTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTT  
AGAAAAATAACAAATAGGGGTTCCGCGCACATTTCCCCGAAAAGTGCCAC

continuation Figure 5a

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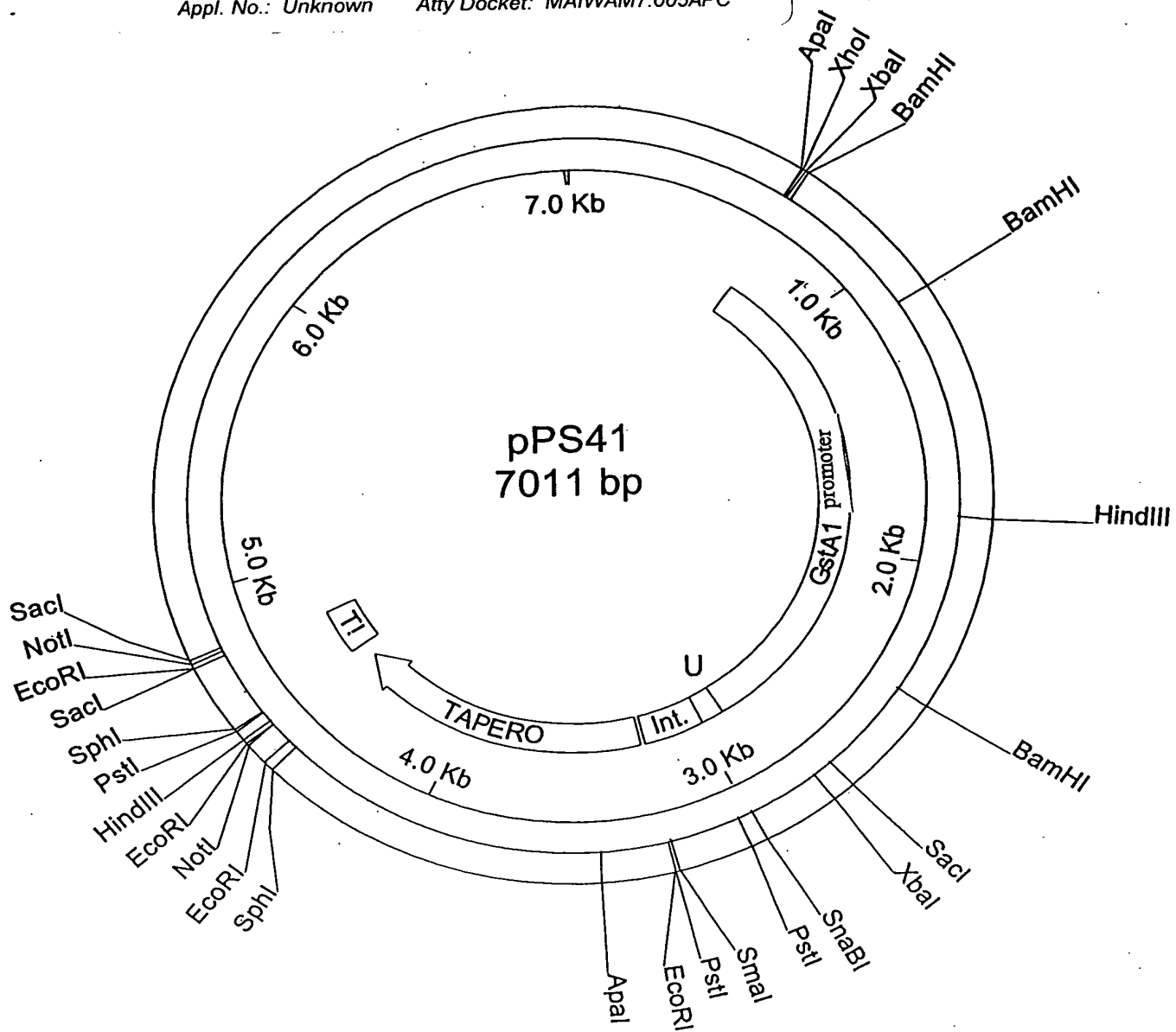


Figure 5b

PROMOTER FOR THE EPIDERMIS-SPECIFIC TRANSGENIC  
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Figure 6

Germin 9f-2.8:

AGCTTATTACATAGCAAGCATGGGGTACTCCAAAACCCTAGTAGCTGGCCTGTTGCAATGCTGTTACTAGCTCCGGCCG  
TCTTGGCCACCGACCCAGACCCTCTCCAGGACTTCTGTGTCGCCGACCTCGACGGCAAGGCGGTCTCGGTGAACGGGCAC  
ACGTGCAAGCCCATGTCGGAGGCCGGCGACGACTTCCTCTTCTCGTCCAAGTTGGCCAAGGCCGGCAACACGTCCACCCC  
GAACGGCTCCGCCGTGACGGAGCTCGACGTGGCCGAGTGGCCCGGTACCAACACGCTGGGTGTGTCCATGAACCGCGTGG  
ACTTTGCTCCCGGAGGCACCAACCCACCACATCCACCCGCGTGCCACCGAGATCGGCATCGTGATGAAAGGTGAGCTT  
CTCGTGGGAATCCTTGGCAGCCTCGACTCCGGGAACAAGCTCTACTCGAGGGTGGTGCGCGCCGGAGAGACGTTCCCTCAT  
CCCACGGGGCCTCATGCACTTCCAGTTCAACGTCGGTAAGACCGAGGCCTCCATGGTCGTCTCCTTCAACAGCCAGAACC  
CCGGCATTTGCTTCGTGCCCTCAGCTCTTCGGCTCCAACCCGCCCATCCCAACGCGGTGCTCACCAAGGCACTCCGG  
GTGGAGGCCAGGGTCGTGGAATTCTCAAGTCCAAGTTTGCCGCTGGGTTTTAATTTCTAGGAGCCTTCCCTGAAATGAT  
AATTATATAATTCATATATGCATGC



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Figure 7a

characteristics of pPS24:

total length 6452 bp  
vector Backbone: pBluescript SK+, entire construct between XhoI and SacI restriction sites

GstA1 promoter 694-2891  
Transcription start: 2892  
GstA1 5' UTR 2892-2988  
WIR1 5' UTR (part) 2989-3034  
WIR1 part of 5' CDS + Intron 3035-3246  
Germin 9f-2.8 Gen 3258-4003  
ATG Germin 3277  
Stop codon: 3949  
CamV 35S Terminator: 4017-4210

Sequenz:

CTAAATTGTAAGCGTTAATATTTTGTAAATTCGCGTTAAATTTTGTAAATCAGCTCATTTTTTAACCAATAGGCCG  
AAATCGGCAAAATCCCTTATAAATCAAAAGATAGACCGAGATAGGGTTGAGTGTGTTCCAGTTTGGAAACAAGAGTCCA  
CTATTAAAGAACGTGGACTCCAACGTCAAAGGGCGAAAAACCGTCTATCAGGGCGATGGCCCACTACGTGAACCATCACC  
CTAATCAAGTTTTTTGGGGTCGAGGTGCCGTAAAGCACTAAATCGGAACCCCTAAAGGGAGCCCCGATTAGAGCTTGAC  
GGGGAAAGCCGGCGAACGTGGCGAGAAAGGAAGGAAGAAAGCGAGAGCGGGCGCTAGGGCGCTGGCAAGTGTAGCG  
GTCACGCTGCGCGTAACACCACACCCGCGCGCTTAATGCGCCGTACAGGGCGCGTCCCATTCGCCATTAGGGCTGCG  
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continuation figure 7a

PROMOTER FOR THE EPIDERMIS-SPECIFIC TRANSGENIC  
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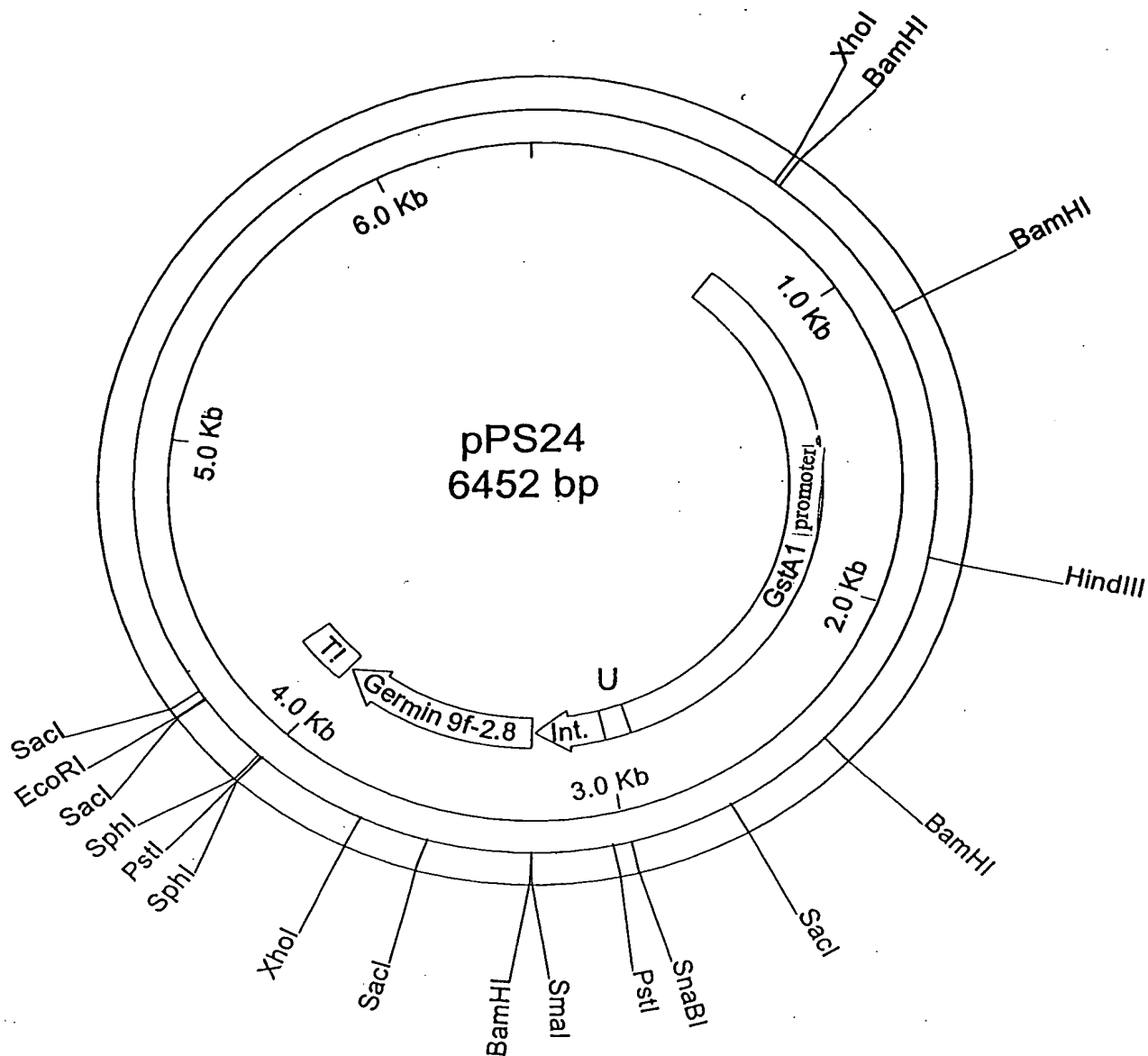


Figure 7b

PROMOTER FOR THE EPIDERMIS-SPECIFIC TRANSGENIC  
EXPRESSION IN PLANTS

Schweizer et al.

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Figure 8

TaMlo inverted repeats and MlaI Intron:

```
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Figure 9a

characteristics of pWIR5-TaM1o-RNAi:

total length	7633 bp
vector Backbone: pBluescript SK <sup>+</sup> , entire construct between XhoI and SacI restriction sites	
GstA1 promoter	694-2891
Transcription start:	2892
GstA1 5' UTR	2892-2988
WIR1 5' UTR (part)	2989-3034
WIR1 part of 5' CDS + Intron	3035-3246
TaM1o IR1	3252-3556
Intron Mla1	3698-4731
TaM1o IR2	4877-5190
CamV 35S Terminator:	5191-5391

Sequenz:

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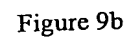
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ATATTATTGAAGCATTTATCAGGTTATTGTCTCATGAGCGGATACATATTGAATGTATTTAGAAAAATAACAAATAG  
GGGTTCCGCGCACATTTCCCCGAAAAGTGCCAC

continuation figure 9a

## Schweizer et al.

Atty Docket: MAIWAM7.005APC

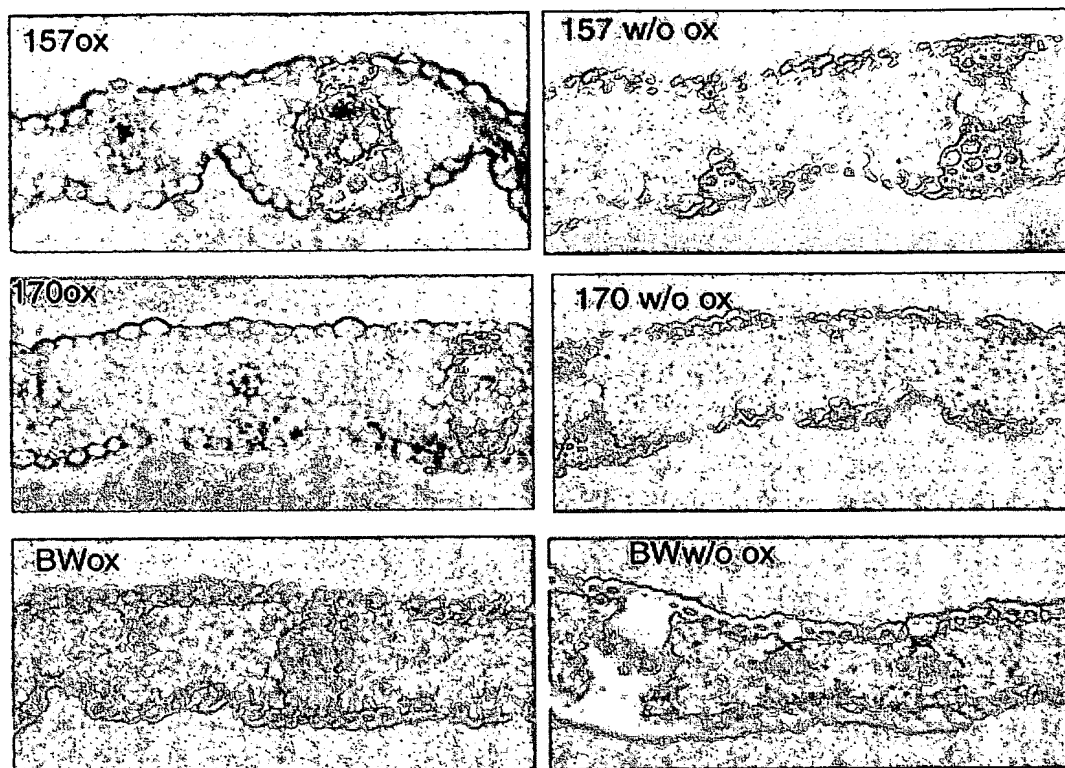


PROMOTER FOR THE EPIDERMIS-SPECIFIC TRANSGENIC  
EXPRESSION IN PLANTS

Schweizer et al.

Appl. No.: Unknown Atty Docket: MAIWAM7.005APC

Figure 10:





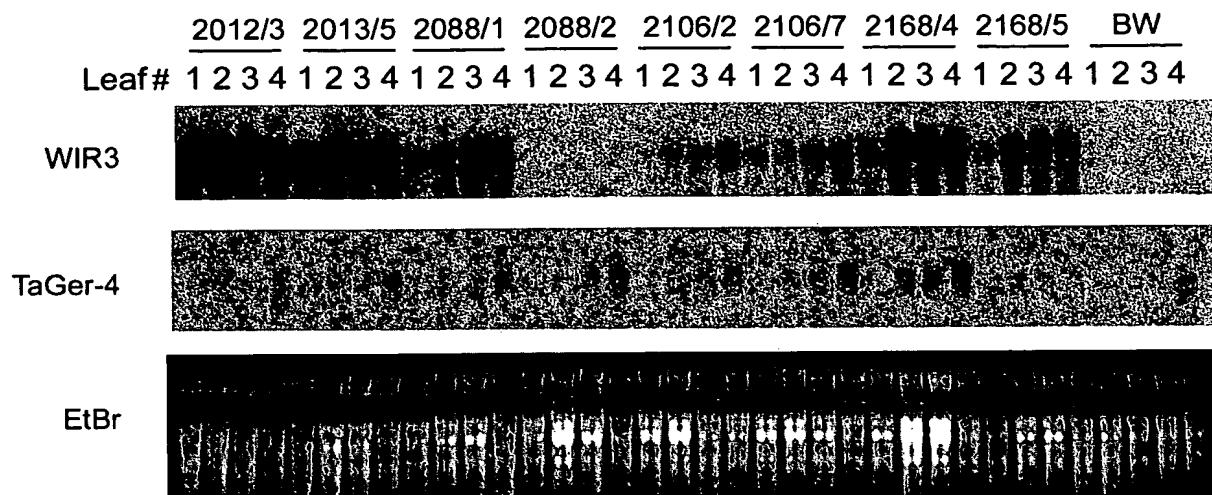
PROMOTER FOR THE EPIDERMIS-SPECIFIC TRANSGENIC  
EXPRESSION IN PLANTS

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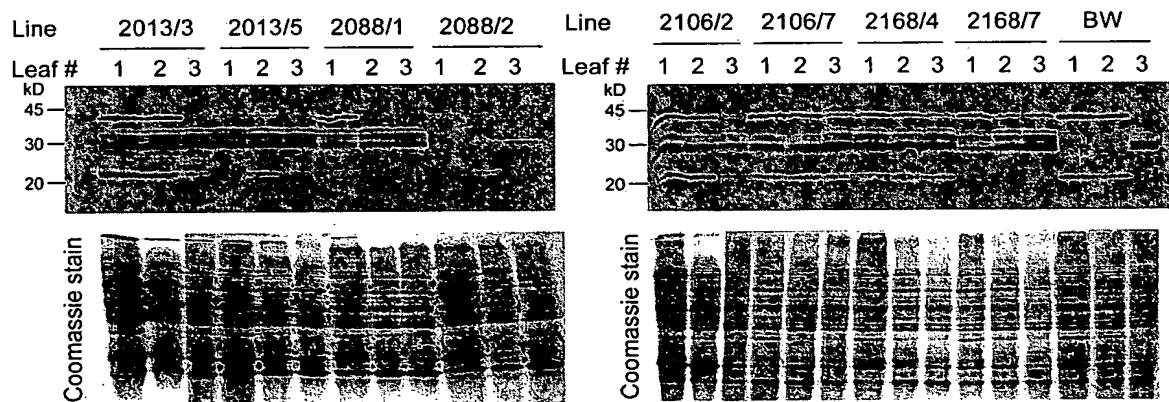
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Figure 11:

a)



b)



A

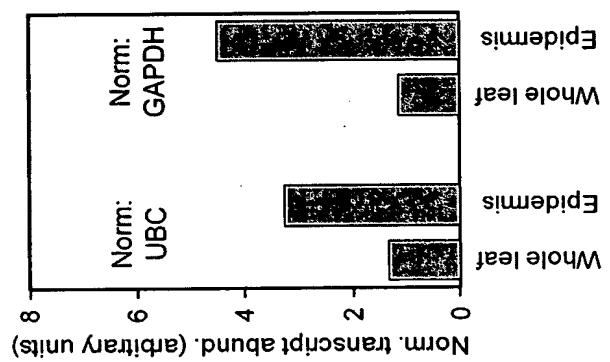
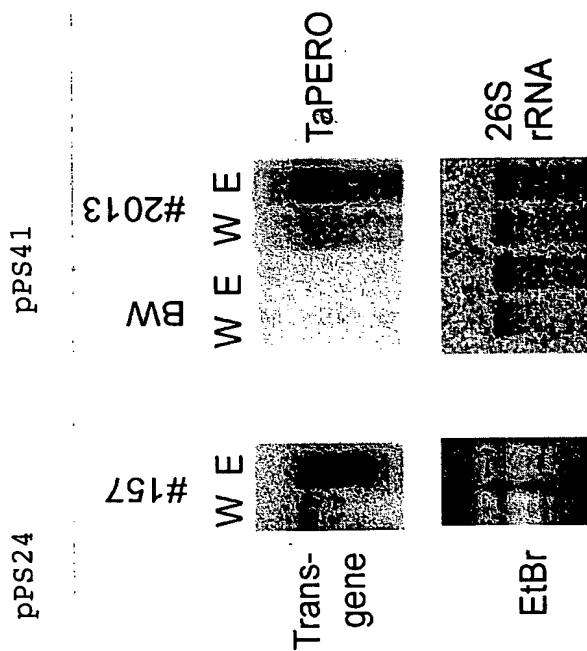


Figure 12  
 C

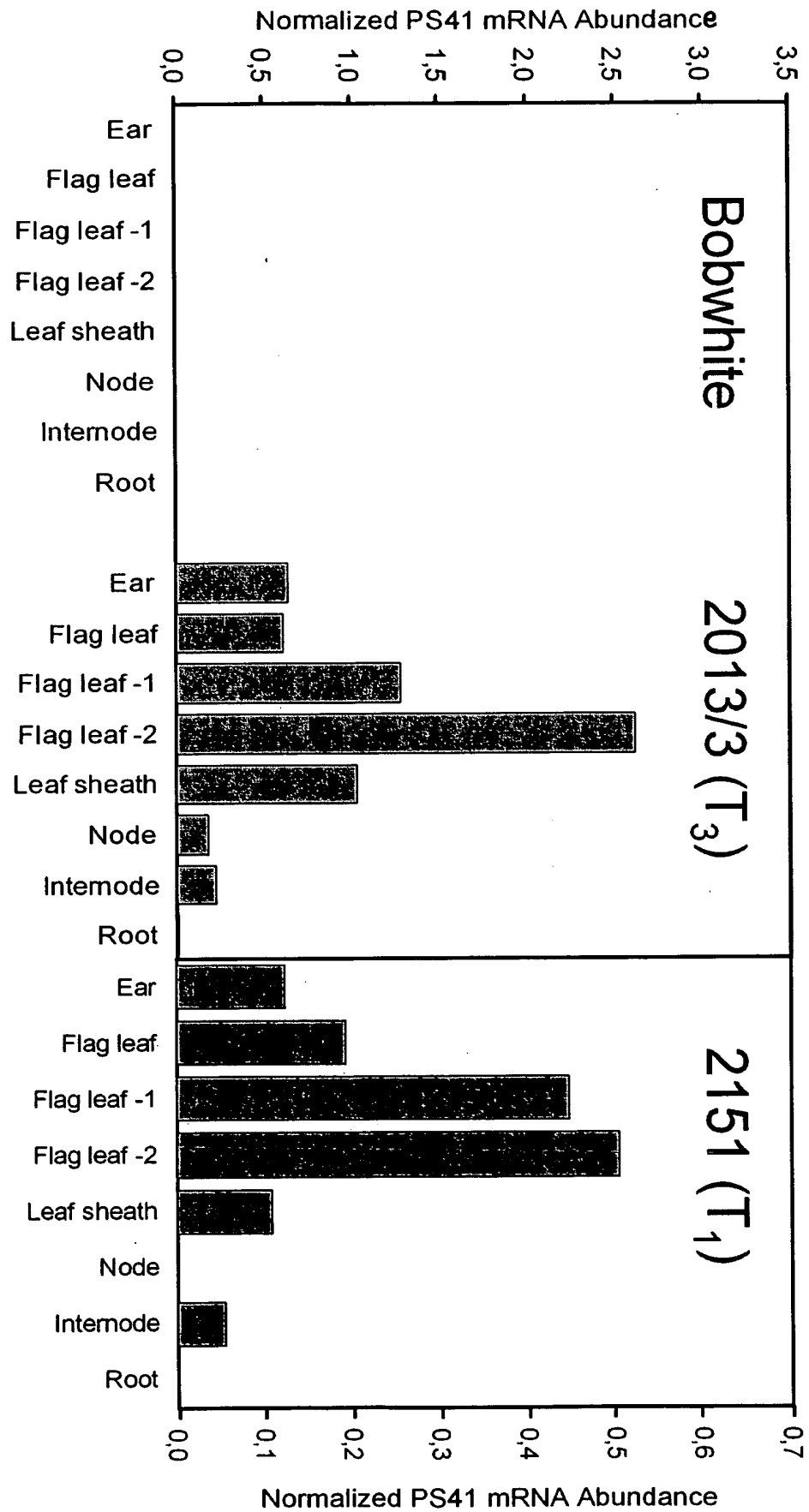
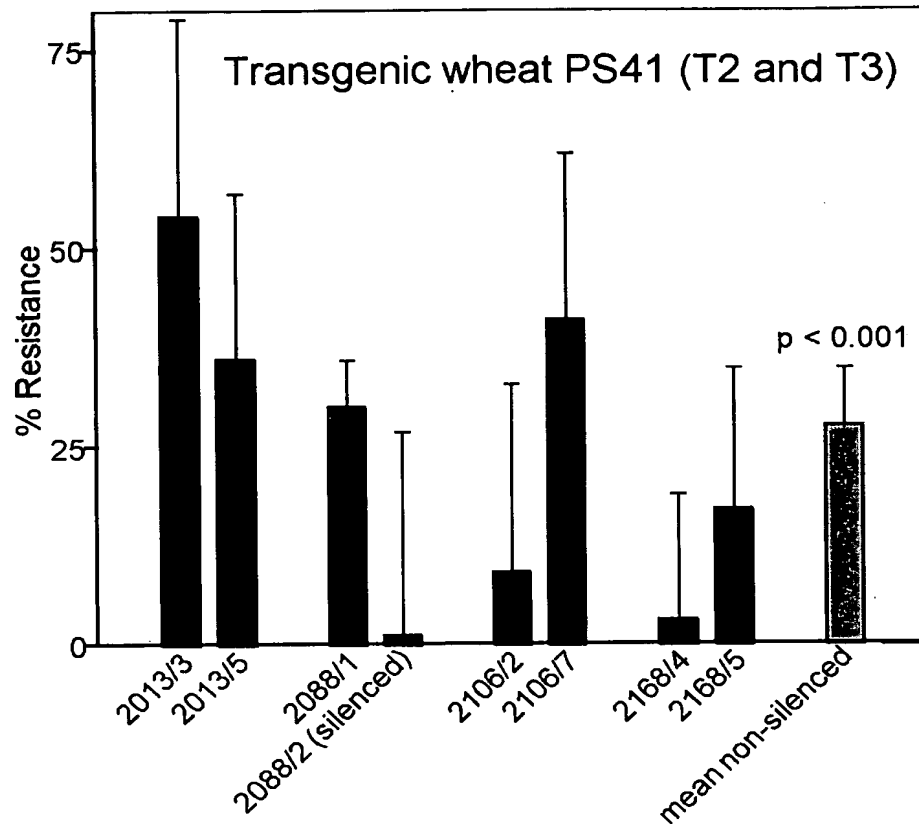


Figure 13:

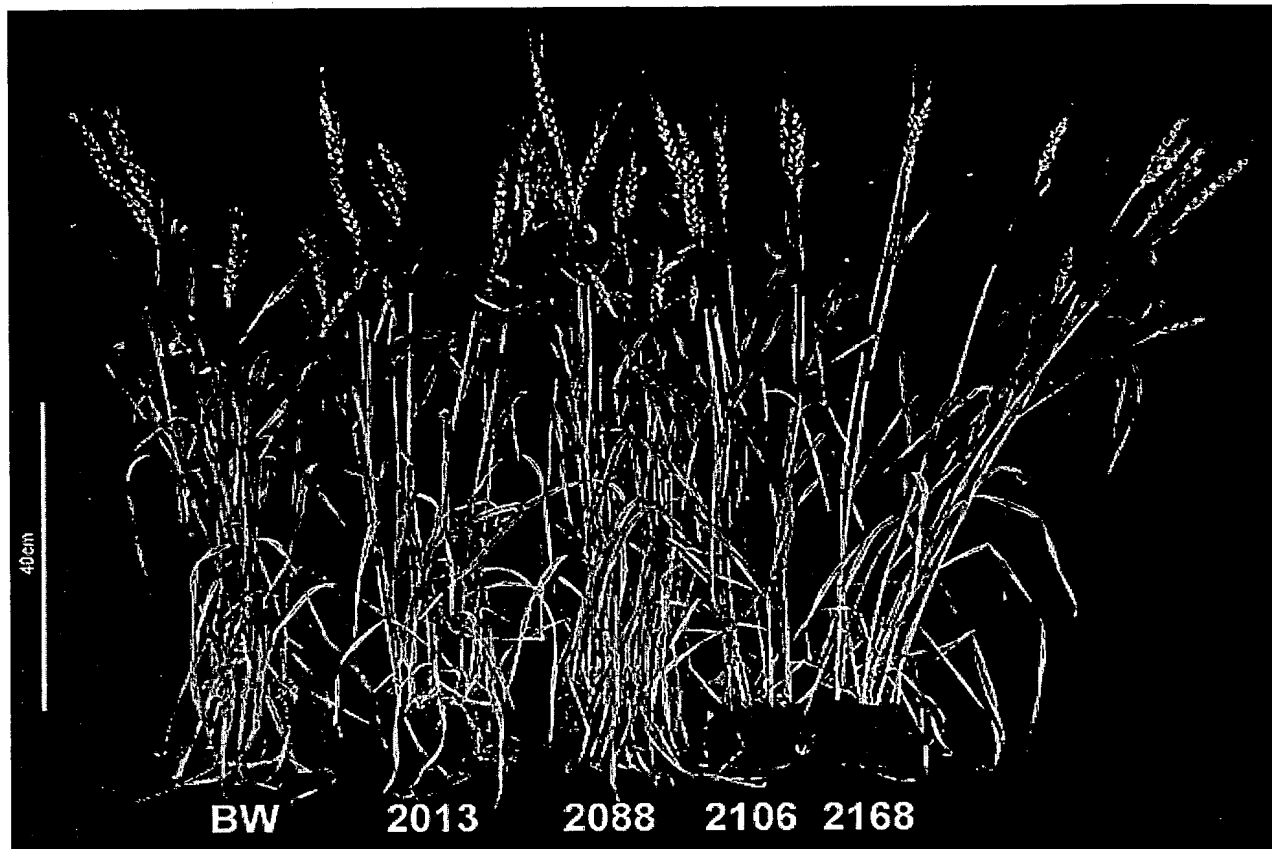
Mildew resistance of transgenic wheat lines that carry the pPS41 construct.



The flag leaf of adult plants was cut away and inoculated with wheat mildew in a detached leaf assay together with Bobwhite wild-type plants. 7 days after inoculation, the mildew infection was evaluated. Mean values from 3 independent inoculation experiments with plants of the T2 and T3 generation are shown. Subline 2088/2 does not express TAPERO and is not increased resistant. Mean non-silenced = mean value of all lines except 2088/2 and all experiments.

Figure 14:

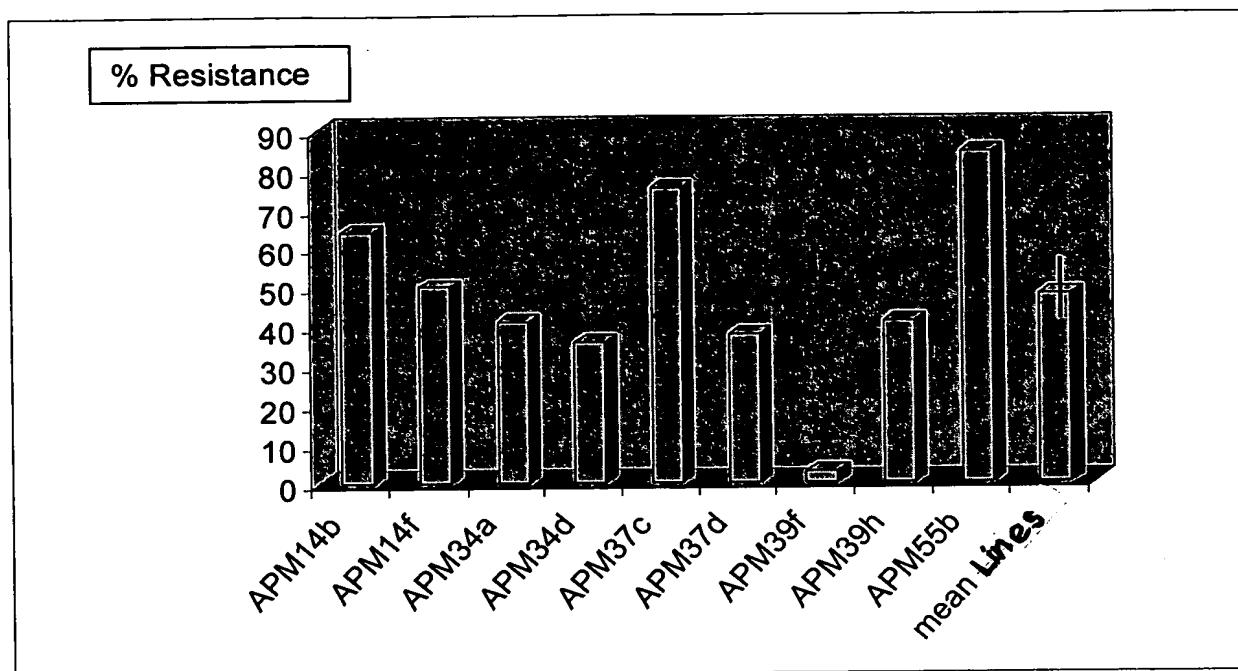
Normal growth-phenotype of transgenic plants carrying the pPS41 construct.



Plants of the T2 generation were sown together with Bobwhite wild-type plants and photographed in the adult plant stage.

Figure 15:

Mildew resistance of transgenic wheat lines carrying the pWIR5-TaMlo-RNAi construct.



The flag leaf of adult plants of the T2 generation was cut away and inoculated with wheat mildew in a detached leaf assay together with Bobwhite wild-type plants. 7 days after inoculation, the mildew infection was evaluated. 2 sublines per line were tested in each case.

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